

# A WIND-POWER GENERATOR POD CONSTITUTED BY THE BODY OF AN ELECTRICITY GENERATOR

The invention relates to a pod for a wind-power generator, the pod being constituted by a rigid fairing in which at least one electricity generator is placed for the purpose of being coupled to at least one wind-driven propeller.

## BACKGROUND OF THE INVENTION

The fairing in a pod of that type is normally made of composite material or of metal and requires special adaptations to cool its internal elements such as the electricity generator. In particular, it is conventional to provide systems for ventilating the inside of the pod, thereby complicating its structure and increasing its weight.

## OBJECT AND SUMMARY OF THE INVENTION

The object of the invention is to remedy that drawback.

According to the invention, the rigid fairing of the pod is formed by the body of the generator in which a stator and a rotor are mounted. This generator body can advantageously contain the gearing of the gearbox and the mechanism for steering the pod, thereby making the pod of the wind-power generator more compact. This simplifies installing the wind-power generator. In addition, this arrangement makes it possible to use the fairing of the pod as a heat exchange surface for cooling the generator and the gearbox. Since the propeller is mounted at the rear of the pod, the wind which drives the propeller of the wind-power generator flows over the body of the generator, thereby improving heat exchange when the generator is in operation.

To maintain laminar flow over the entire length of the pod for the wind driving the propeller, provision can advantageously be made for the rigid fairing of the pod to be surrounded by a tubular sleeve forming a substantially annular passage for air along the pod.

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~~42~~ To further increase heat exchange between the stator and the fairing of the pod, provision can be made for the fairing of the pod to be an interference fit on the stator of the generator. This arrangement also

5 reinforces the mechanical cohesion of the elements mounted inside the pod and reduces vibration phenomena.

The flow of hot air created by the rotation of the rotor is advantageously directed towards the inside surface of the fairing of the pod via lateral openings

10 extending right through the stator.

In a particular embodiment of the pod of the invention, the generator is coupled to the propeller via an epicyclic gearbox having inlet and outlet shafts that are on the same axis, thus enabling the propeller to be

15 mounted directly on the outlet of the shaft of the generator. This arrangement also contributes to reducing the number of gear wheels in the gearbox.

#### BRIEF DESCRIPTION OF THE DRAWING

The wind-power generator pod of the invention is described below in detail with reference to the sole figure which shows it in highly diagrammatic manner as mounted at the top of a mast.

#### MORE DETAILED DESCRIPTION

The highly diagrammatic figure shows part of a wind-power generator comprising a pod 1 mounted to swivel at the top of a vertical mast 2.

As can be seen in the figure, the pod 1 is substantially cylindrical in shape extending along an axis of revolution A that is perpendicular to the mast 2.

30 ~~42~~ An electricity generator constituted by a stator 3 and a rotor 4 (shown in part in the figure above the axis A) is mounted inside the pod and is coupled to at least one propeller such as 5 via an epicyclic gearbox (stepdown gearbox) 6.

35 ~~43~~ The rigid outer fairing 7 of the pod is formed by the metal body of the generator. It is surrounded coaxially by a tubular sleeve 8 which forms an annular

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passage for the wind V driving the propeller 5. The end of the sleeve 8 facing the wind V is flared in this case and the propeller 5 is mounted at the back of the pod relative to the wind direction so as to maintain a degree of stability in the flow of air along the passage formed by the sleeve 8. The gearbox 6 is mounted inside the fairing 7 and the propeller 5 is fixed directly to the outlet of the shaft, thereby simplifying mechanical assembly and in particular simplifying coupling between the generator and the gearbox.

<sup>DS</sup>  
<sup>AS</sup> The sleeve 8 can be held at a distance from the fairing 7 by means of supporting cross-members such as 9.

<sup>DS</sup>  
<sup>AS</sup> The system 10 for steering the pod is shown as being integrated in the top of the mast 2, but it equally well be located inside the pod 1 which would contribute to simplifying installation of the wind-power generator.

<sup>DS</sup>  
<sup>AS</sup> The fairing 7 is advantageously an interference fit on the stator 8 and lateral openings 11 pass right through the stator so as to direct the hot air created by rotation of the rotor against the fairing 7 so that said hot air is cooled by flowing along the fairing 7 which acts as a heat exchanger with the air on the outside of the pod.

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